

## **CONCLUSIONS**

PCB concentrations vary spatially in the Delaware River estuary, with increased contaminant levels downstream of Philadelphia, PA and Camden, NJ. In addition to the spatial variability of PCB concentration, congener patterns showed increased presence of highly chlorinated congeners, specifically nona- and deca- polychlorinated biphenyls in Zone 4 and 5 for all sediment and biota samples. This trend indicates the presence of a non-Aroclor source of PCB contamination to the Delaware River. While elevated levels of extremely hydrophobic biphenyls are seen throughout the food web, contrasting life history and migratory patterns result in varying accumulation of PCB congeners in biota. Organisms closely associated with contaminated sediment have greater accumulation of hydrophobic PCB congeners than do migratory species such as white perch. These distinctions should be addressed when modeling the transfer of contaminants in an estuarine system such as the Delaware River.

Modeling contaminant transfer in estuarine systems requires attention to multiple parameters. Simplistic models based on factors such as BCFs and BSAFs may apply blanket values to estuarine systems but additional inputs of species-specific lipid content, growth, reproduction, uptake and elimination kinetics are required for increasingly elaborate models. Considerations of seasonal variations are applicable to lower trophic species such as invertebrates that follow boom and bust dynamics and varying lipid contents have may have great impact on lipid normalized contaminant concentrations. Higher trophic levels do not follow such extreme fluctuation in lipid content although seasonal spawning does affect lipid reserves. PCB contaminant values determined from this study may be used to establish water and sediment quality criteria, setting a goal for acceptable contaminant levels. By reducing loadings in the river, PCB body burdens in recreational and commercial fisheries should decrease thereby protecting human and wildlife endpoints from adverse chemical effects.